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(74) Attorney: LORENZ, Werner; Alte Ulmer Strasse 2,  
89522 Heidenheim (DE).

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(71) Applicant (for all designated States except US): CARL  
ZEISS SMT AG [DE/DE]; Carl-Zeiss-Strasse 22, 73447  
Oberkochen (DE)

(72) Inventors; and

(75) Inventors/Applicants (US only): DIECKMANN, Nils  
[DE/DE]; Reuteweg 5, 73460 Hüttlingen (DE). MAUL,  
Manfred [DE/DE]; Elchweg 29, 73434 Aalen (DE).  
FIOLKA, Damian [DE/DE]; Adalbert-Srifter-Weg 14, 73447  
Oberkochen (DE).

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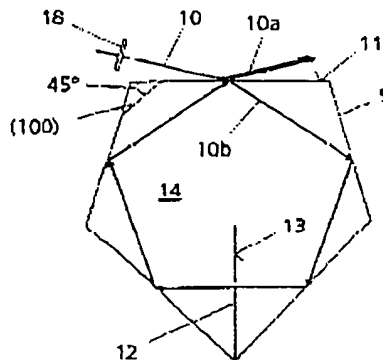
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(54) Title: SYSTEM FOR REDUCING THE COHERENCE OF LASER RADIATION

(54) Bezeichnung: SYSTEM ZUR REDUZIERUNG DER KOHÄRENZ EINER LASERSTRAHLUNG



(57) Abstract: The invention relates to a system for reducing the coherence of a wave front-emitting laser radiation (10b), especially for a projection lens for use in semiconductor lithography, wherein a first partial beam (10a) of a laser beam (10) incident on a surface (11) of a resonator body (9) is partially reflected. A second partial beam (10b) penetrates the resonator body (9) and emerges from the resonator body (9) at least approximately in the area of entry after a plurality of total internal reflections. The two partial beams (10a and 10b) are then passed on jointly to an illumination plane. The resonator body (9) is adapted, in addition to splitting the laser beam into partial beams (10a, 10b), to modulate the wave fronts of at least one partial beam (10b) during a laser pulse. The partial beams (10a, 10b) reflected on the resonator body (9) and penetrating the resonator body are superimposed downstream of the resonator body (9). The resonator body (9, 9') is provided with a phase plate (12) having different local phase distribution.

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(57) Zusammenfassung: Bei einem System zur Reduzierung der Kohärenz einer wellenförmigen auskennenden Laserstrahlung (10b), insbesondere für ein Projektionsobjektiv in der Halbleiterlithographie wird ein von dem auf eine Oberfläche (11) eines Resonatorkörpers (9) auftreffenden Laserstrahles (10) ein erster Teilstrahl (10a) teilreflektiert. Ein zweiter Teilstrahl (10b) tritt in den Resonatorkörper (9) ein und tritt nach mehreren Totalreflexionen wenigstens annähernd im Bereich der Eintrittsstelle wieder aus dem Resonatorkörper (9) aus. Anschließend werden die beiden Teilstrahlen (10a und 10b) gemeinsam zu einer Beleuchtungsbene weitergeleitet. Der Resonatorkörper (9) ist derart ausgebildet, dass zusätzlich zu der Aufteilung in Teilstrahlen (10a, 10b) die Wellenfronten wenigstens eines Teilstrahles (10b) während eines Laserpulses moduliert werden, wobei die an dem Resonatorkörper (9) reflektierten und die in den Resonatorkörper eintretenden Teilstrahlen (10a, 10b) nach dem Resonatorkörper (9) überlagert werden und wobei der Resonatorkörper (9,9') mit einer Phasentafel (12) mit unterschiedlicher lokaler Phasenverteilung versehen ist.

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